Thermodynamics

- Branch of physics concerned with heat and temperature and their relationship to work and energy

Four laws

Zeroth: When 2 systems are in equilibrium with a third system, the first 2 are also in equilibrium with each other (a=c, b=c, then a=b)

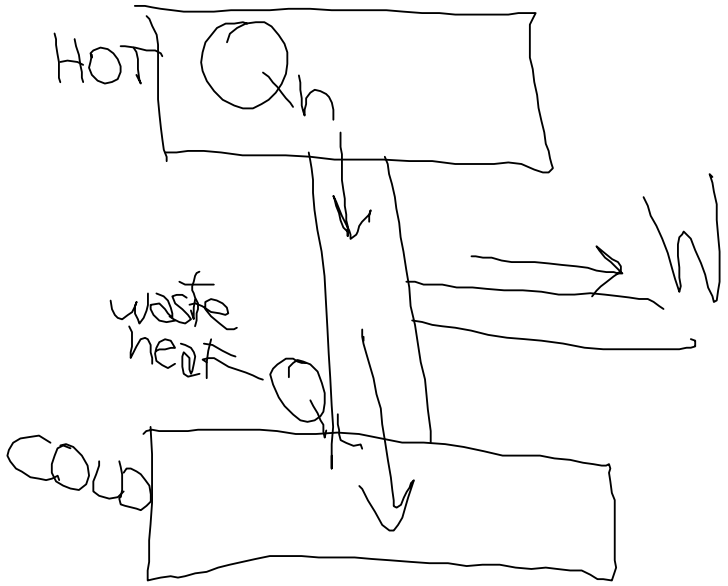
First: Energy can only change forms. Net heat supplied to the system equals net work done by the system (Q = W + heat added) ex: steam engines

Second: ENTROPY - entropy of an isolates system not in equilibrium will increase over time. Entropy measures randomness in a system. (add heat = increase entropy)

Third: As temperature approaches absolute zero, entropy approaches a constant minimum

heat engine (1st law)

$$Q_H = W + Q_L$$



Refrigerator

$$Q_L + W = Q_H$$